REMARKS:

Claims 1-11 are currently pending in the present application. Claims 1, 2, 7, 8, and 10-12 have been rejected under 35 U.S.C. 102(b) as being anticipated by Dow (US 5,877,778). Applicants respectfully disagree, for at least the reasons set forth in the discussion that follows. Claims 12-14 have been added. Support for new claims 12-14 may be found throughout the specification, including FIGS. 13-15. No new matter is introduced by these amendments. Claim 9 has been amended to correct its dependency.

The examiner objected to the drawings as failing to comply with 37 CFR 1.84(p)(4) because the reference character "700" has been used to designate both data boxes of Figures 9A and 9B. Applicants have submitted proposed drawing corrections whereby the data is referred to as 700A in FIG. 9A and 700B in FIG. 9B. A corresponding change has been instituted in the Specification, at page 20, to clarify the reference number designations. Applicants respectfully request that the examiner enter the replacement sheet for the identified drawings and the specification replacement paragraph and withdraw the objections.

Claim Rejections Under 35 USC 102 and 103:

Claims 1, 2, 7, 8, and 10-12 have been rejected under 35 U.S.C. 102(b) as being anticipated by Dow (US 5,877,778). Claims 3, 4, and 9 have been rejected under 35 U.S.C. 103 as being unpatentable over Dow (US 5,877,778) in view of Mohri (US 6,515,669). Applicants respectfully disagree. Dow relates generally to providing articulated figure movement on the basis of prestored motion units for joints of the articulated figure. The user is permitted to mix previously stored motion units (col. 3, lines 32-35), i.e. to manipulate those stored motion units to produce articulated figure motion (col. 3, lines 44-47). This manipulation is directed to generating a final rotation value for each joint in the 3D shape (col. 10, lines 15-25).

More specifically, Dow combines various motion units to generate an overall motion for the three dimensional object. Certain of the prestored motion units more closely resemble the essence of the motion of the skeleton and these motion units are

selected to influence the depicted motion to a greater degree than others. The joint's relative priority to the purpose of the particular movement is determined from the weight given to the joint (col. 9, lines 40-45)

To illustrate, where a human figure defined by the articulated figure generates a punching or kicking motion, the motion of each joint is defined for each frame of the animation sequence. The motion units for the joints are then combined by a weighted sum calculation, the higher weight given to the motion units showing the essence of the movement. That is, for a kick motion, the hip, foot, knee and ankle joints (leg joint motions) provide more influence on the depicted motion than a hand motion or wag-head motion (col. 10, lines 25-55). Thus, the weighting in Dow applies different weights to the various joint motions to generate the essence of an overall motion desired. That is, the essence of the overall motion unit in Dow is expressed by determining which joints of the articulated figure relate to the essence of the motion and applying higher weights to those joints as compared to other joints. To be sure, Dow describes the use of weighting in the generation of motion of the three dimensional object. **But this weighting is applied to stored motion units in determining the final rotation value for the joint and is not the weighting of vertices described in the specification of the current application and explicitly defined in the claims.**

Dow also describes a weight factor that is a variable of time, gradually increasing from 0 at the start of a motion unit and finally decreasing at the end (col. 11, lines 5-8). See also FIG. 21. As with the weighting factors applied to the motion units, these too are not weightings applied to the vertices as required by the limitations of claim 1. Instead, they are weights applied prior to determining a final rotation value for the joint.

In other words, the weighting techniques applied in Dow, whether they are time variable (at the beginning and ending frames of a particular motion unit) or variable across different motion units, are applied prior to determining the 3D position of each joint of the articulated figure. This is further illustrated in FIG. 9B of Dow, where the weighting described by Dow all occurs within the first block, before the 3D position of each joint is determined and certainly before the articulated figure's tissue data is used to build the articulated figure's body on the joint positions so determined. In contrast, the invention as recited in claim 1 applies the weighting to the vertexes

and thereby obtains a smoother motion than provided by the joint weighting techniques described in Dow. Further, instances where the surface vertex of the 3D figure might be buried within the figure are eliminated by the vertex weighting techniques as defined in the claims.

By using a weight predefined for the vertex corresponding to the joint in calculating the rotation angle of the vertex, as required in claim 1, the invention defined by claim 1 can move the vertex to avoid instances where the vertexes might be buried in the figure as a result of a simplified transformation process. This difference is significant because it allows for smooth motion. For example, where the shape of an object determined before rotation for the joints is a rectangular shaped polygon, the weighting may change the shape into a trapezoid after rotation. This is illustrated in FIGS. 10A and 10D of the subject application. By this method defined in the claims, a smooth change in the shape of the object may be effectuated even as the joint completes the rotation.

Dow's teachings as to weighting of the joints do not teach or suggest the limitations of claim 1 and further do not provide the smooth movement advantages of the invention defined in claim 1. In other words' Dow's weighting of the joints fails to prevent overlapping of the three dimensional objects such as illustrated in FIG. 10C. Through the novel application of weighting to the vertexes, the shape of the three dimensional object changes so that the vertexes making up the object move to positions after rotation in order to avoid the overlap problem described. Mohri merely describes the use of interpolation for a finger position as used with an input device. Thus, for at least the foregoing reasons, the art of record fails to teach or suggest all elements of claim 1. Claims 7, 10, and 11 are submitted to be patentable for at least the same reasons discussed with respect to claim 1,including that the art of record fails to teach or suggest calculating the rotation angle of the vertex on the basis of the rotation angle of each joint obtained with the obtaining of the rotation angle and the weight predefined for the vertex.

Claims 12-14 have been added. For at least the same reasons as discussed above with respect to claim 1, applicants submit that claim 12 is patentable over the art of record. That is, none of the art of record teaches or suggest determining a second position for each of the plurality of vertexes based on the joint position of the corresponding joint and a weight predefined for the each of the plurality of vertexes as

required by claim 12. As stated earlier, Dow applies weighting in determining the positioning of the joints, not in determining the second position of a vertex corresponding to a joint. For at least these reasons, applicants submit that new claims 12-14 are patentable over the art of record.

Claims 2-6, 8-9, and 13-14 are dependant claims which are believed to be patentable over the art of record for the same reasons as discussed above with respect to the independent claims. Moreover, the dependent claims recite additional limitations, and are therefore allowable for these reasons as well. However, in light of the above distinctions in the independent claims, further discussion of the dependent claims is deemed unnecessary. Thus claims 2-6, 8-9, and 13-14 are submitted to be allowable at least due to their respective dependencies from an allowable independent claim.

Applicants thank the examiner for his indication of allowable subject matter in claims 5 and 6. However, in light of the discussion above as to claim 1, applicants believe that claims 5 and 6 are allowable in their present form.

Conclusion:

Applicants believe that all pending claims 1-14 are allowable and respectfully requests a Notice of Allowance for this application from the Examiner.

Respectfully submitted,
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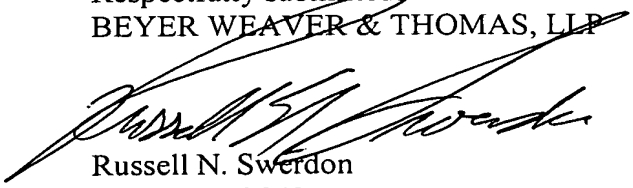

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